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(71) Applicant (for all designated States except US): **HOLLAND LP** [US/US]; 1000 Holland Drive, Crete, IL 60417 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KRAL, Richard, F.** [US/US]; 2312 South 10th Avenue, North Riverside, IL 60546 (US). **MAYHILL, Shane, A.** [US/US]; 1712 Dixie HWY., Lot 130, Crete, IL 60417 (US). **JOHNSON, Matthew, Q.** [US/US]; 4446 Long Shadow Lane, Santa FE, NM 87507 (US). **ROVNYAK, Mark, E.** [US/US]; 19152 Kristine Trail, Mokena, IL 60448 (US). **COOMER, Daniel, J.** [US/US]; 1 Kentucky Court, Park Forest, IL 60466 (US).

(74) Agent: **BREZINA, David, C.**; Barnes & Thornburg, P.O. Box 2786, Chicago, IL 60690 (US).

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(54) Title: **METHOD OF REPAIRING A RAIL**

(57) Abstract: A system or method of repairing railroad rails which includes a head, upright and base sections. The method includes at least the following steps: identifying and locating a defect in the rail, removing the defect by removing material from the rail surrounding the defect in at least the head section so as to form a void and a rail void interface while maintaining continuity of the rail, filling the void with molten metal having a high carbon content and causing the molten metal and the rail void interface to bond. The molten metal may be produced by gas shielded arc welding. The carbon content of the molten metal is near that of the rail to decrease carbon migration from the rails. High carbon welding electrode is used in the welding of high strength steel using gas shielded arc welding techniques whereby a plurality of beads of molten weld material join together rail ends or fill a slot in a rail for repair purposes, the high carbon electrode avoiding adjacent soft and brittle areas across a weld fusion line which result from migration of carbon from the carbon rich high strength steel to the lower carbon weld deposit.